

PH Kinzett – wood fuel proves profitable choice

Switching to wood energy has helped Blenheim based PH Kinzett Ltd cut fuel costs at its greenhouse operation by 21%, helping to maintain profitability.

Traditional family business

PH Kinzett is a 100-year old family-owned business growing grapes, cherries and tomatoes on its site outside Blenheim. The tomato growing operation concentrates on long season and winter production, using hydroponics in glasshouses covering two hectares.

With a staff of 10, owner Paul Kinzett's business is a small to mid-scale operation in an industry of several hundred competitors.

Keen to get out of coal

Consistent warmth is critical to the hydroponic tomato growing process. In common with most South Island growers, Kinzett had been fuelling its boilers with coal, burning between 1,000 and 1,200 tonnes a year. This added up to a major cost for the business, second only to its labour costs.

Additionally Kinzett wanted an environmentally friendly fuel option lower in CO₂ and particulate emissions and less dirty for its staff to handle. Technical advice showed that it was practical to convert the existing coal boiler to wood.

A payback analysis suggested that the project would pay for itself in three years.

Making the change

The glasshouses are in two main blocks, operated as three control zones kept at between 16° and 18°C. Heating is hot-water based. There are actually two boilers on site, one main boiler and one standby, plus a large heat store.

The main boiler is a Morrow Engineering 'Tripass' rated at 4MW. Designed originally for coal firing, Morrow was confident it could be converted successfully.

Most of the work involved creating spaces and a system for storing and transporting the new fuel. A covered 'feed' bunker was constructed with a walking floor and various augers installed for transporting the fuel. Along with the feed bunker, there is also a bigger external bunker to save the wood.

The furnace needed a new, thicker refractory lining, and fan speeds needed altering.

To minimise any effect on the operation, Kinzett undertook the majority of the work during the warmer summer months allowing them to burn small amounts of coal in the standby boiler – and maintain the growing conditions in the glasshouse.

Operating with wood fuel takes about the same time it did with coal although it's now a much more pleasant task. Topping up the feed bunker and cleaning the boiler are both daily tasks. De-ashing is done daily.

The supply issue

Wood supply was always a key part of the equation. As a relatively low-density fuel, it's not economic to truck wood chips any long distances, so the supply has to be local.

A promising source of supply was available from a local project that would have provided good quality wood chips. However, just as Kinzett's conversion was nearing completion, it collapsed. An alternative was found, but it involved accepting wood chips with higher moisture content.



Based outside Blenheim, PH Kinzett grow grapes, cherries and tomatoes.

✓ Key features

- Existing coal fired 4MW boiler converted to burning wood
- Retains 'dual fuel' capability for energy security
- Burns about 4000 tonnes of wood a year

✓ Key benefits

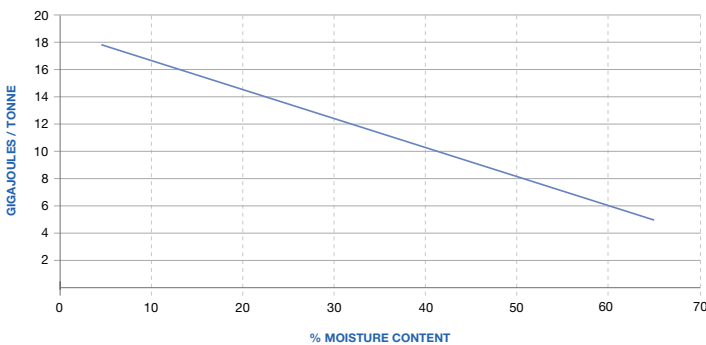
- 21% saving in fuel costs
- 2,100 tonne/year reduction in CO₂ emissions
- Simple payback 3.2 years (IRR 25%)
- Efficiency, output and returns improving with drier woods and operational improvements
- \$4,700 p.a. saving in ash disposal costs

✓ Sector relevance

- Commercial greenhouse growers
- Food and beverage processors
- Hospitals and schools with space heating requirements



It was a steep learning curve getting the boiler to operate optimally. The boiler produced a lot of steam – indicating that Kinzett was not getting as much heat out of the fuel as planned. The consequence of this was they had to burn more chips to get the same level of energy. However the experience proved the system can handle wet wood and still be economic.



Reducing energy value of wood fuel with increasing moisture content (% wet basis)

Improving outlook

The supply situation – along with the project's performance and return – improved when Flight Timber, a local wood processor, began to supply Kinzett with sawdust boiler fuel. The sawdust is more economic than the chips, in this instance and has a lower moisture content.

Flight Timber created an additional revenue stream for themselves by improving their energy efficiency of their plant – and using a combination of two by-products from their operation, hogged offcuts and sawdust, rather than sawdust alone. This freed up the majority of the sawdust which is then sold to Kinzett.

The wood chip that Kinzett used previously isn't being wasted either. It's going to a local MDF plant – proving the versatility of wood as fuel.

With the success of the project, Kinzett is considering converting the standby boiler to wood energy too.

Key personnel

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MAY 2010/EEC1479



Kinzett's perspective

Paul Kinzett, Managing Director

"I recall what our technical advisor said at the start – for the first six months you'll wish like hell that you'd had nothing to do with it. After that, you'll be really happy you made the decision to convert. It's not all beer and skittles. The learning curve is quite steep. You have to get used to all the bits and pieces of handling a new fuel and how to burn it.

"But we're now in the swing of it, and it's saving us the equivalent of around one salary. When we only have 10 staff, that's really worthwhile.

"It's also very consistent. We don't get the variations like we used to with coal. They'd start on a new seam in the mine and the makeup of the coal would be quite different and give you different outcomes.

"Plus, we don't get as much ash from the wood, and there's a possibility later that it may get utilised by local vineyards.

"We're certainly happy with the change. The exercise has been well worthwhile, and the longer and harder we run that boiler the better it seems to run."



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